

IN THE CLAIMS

1. (Currently Amended) A digital radiography imager, comprising:
a single energy detection layer; and
an x-ray converting layer disposed above the single energy detection layer,
wherein the single energy detection layer is coupled to receive light from the x-ray
converting layer, wherein the x-ray converting layer has a first surface adjacent to
the single energy detection layer and a second surface on an opposite side to that
of the first surface~~the single energy detection layer~~ and wherein the digital
radiography imager is configured such that x-rays traverse the single energy
detection layer before propagating through the x-ray converting layer.
2. (Previously Presented) The digital radiography imager of claim 1, wherein
an intensity level corresponding to the x-rays received by the imager is greater
near the first surface relative to the second surface of the single energy converting
layer.
3. (Original) The digital radiography imager of claim 2, wherein the x-ray
converting layer comprises a scintillating material to produce visible light from x-
rays.
4. (Previously Presented) The digital radiography imager of claim 3, wherein
the single energy detection layer comprises photodiodes to detect the visible light.
5. (Original) The digital radiography imager of claim 2, wherein the x-ray
converting layer comprises a semiconductor material to draw electrical charges
across the semiconductor material.

6. (Original) The digital radiography imager of claim 2, wherein the x-ray converting layer comprises a photoconductor material to produce electrical charges across the semiconductor material.
7. (Previously Presented) The digital radiography imager of claim 5, wherein the single energy detection layer comprises a plurality of charge-collection electrodes to collect the electrical charges.
8. (Previously Presented) The digital radiography imager of claim 1, further comprising a protective layer disposed below the single energy detection layer.
9. (Previously Presented) The digital radiography imager of claim 8, further comprising a substrate layer disposed between the single energy detection layer and the protective layer.
10. (Currently Amended) A flat panel imager, comprising:
a photodiode layer;
a light transparent layer disposed above the photodiode layer; and
a scintillator layer disposed above the light transparent layer,
wherein the scintillator layer has a first surface adjacent to the light transparent layer and a second surface on an opposite side to that of the first surface ~~of the light transparent layer~~, and wherein the flat panel imager is configured such that x-rays traverse the photodiode layer before propagating through the scintillator layer.
11. (Original) The flat panel imager of claim 10, wherein a light intensity generated by the scintillator layer is greater near the first surface of the scintillator layer adjacent to the light transparent layer relative to the second surface of the scintillator layer.

12. (Original) The flat panel imager of claim 11, wherein the photodiode layer comprises a CCD-based sensor.
13. (Original) The flat panel imager of claim 11, wherein the photodiode layer comprises a CMOS-based sensor.
14. (Original) The flat panel imager of claim 11, further comprising a TFT layer disposed below the photodiode layer.
15. (Original) The flat panel imager of claim 10, wherein the scintillator layer comprises a phosphor scintillator.
16. (Original) The flat panel imager of claim 10, wherein the scintillator layer comprises a cesium iodide scintillator.
17. (Original) The flat panel imager of claim 10, wherein a mirror layer is disposed above the scintillator layer.
18. (Original) The flat panel imager of claim 17, wherein a protective layer is disposed below the photodiode layer.
19. (Original) The flat panel imager of claim 18, wherein a substrate layer is disposed between the protective layer and the photodiode layer.
20. (Original) The flat panel imager of claim 19, further comprising a casing that holds the flat panel imager together, wherein the casing forms an aperture window to receive x-rays.
21. (Canceled)

22. (Currently Amended) A flat panel imager, comprising:
a semiconductor layer disposed above a charge-collection layer; and
a bias electrode layer disposed above the semiconductor layer, the bias electrode to generate an electric field within the semiconductor layer, wherein the semiconductor layer has a first surface adjacent to the charge-collection layer and a second surface adjacent to the bias electrode, and wherein the flat panel imager is configured such that x-rays traverse the charge-collection layer before propagating through the semiconductor layer, wherein electric charges drawn across the semiconductor layer ~~is~~are greater near the first surface of the semiconductor layer adjacent to the charge-collection layer relative to the second surface of the ~~charge-collection~~semiconductor layer.

23. (Previously Presented) The flat panel imager of claim 22, further comprising a TFT matrix layer disposed below the charge-collection layer.

24. (Previously Presented) The flat panel imager of claim 22, wherein the semiconductor layer comprises an amorphous selenium material.

25. (Previously Presented) The flat panel imager of claim 22, wherein the charge-collection layer comprises a plurality of charge-collection electrodes.

26. (Original) The flat panel imager of claim 22, further comprising a casing that holds the flat panel imager together, wherein the casing forms an aperture window to receive x-rays.

27. (Currently Amended) A digital radiography system, comprising:
an x-ray source to transmit x-rays;
a flat panel imager to receive the x-rays and to produce a digitized image,
comprising:

a photodiode layer;
a light transparent layer disposed above the photodiode layer;
a scintillator layer disposed above the light transparent layer; and
a mirror layer disposed above the scintillator layer; and

a display system connected to the flat panel imager, the display system to display the digitized image, wherein the ~~scintillating~~ scintillator layer has a first surface adjacent to the light transparent layer and a second surface adjacent to the mirror layer, and wherein the flat panel imager is configured such that x-rays traverse the photodiode layer before propagating through the scintillator layer.

28. (Original) The system of claim 27, wherein a light intensity generated by the scintillator layer is greater near the first surface of the scintillator layer adjacent to the light transparent layer relative to the second surface of the scintillator layer.

29. (Original) The system of claim 27, wherein the photodiode comprises a CCD-based sensor.

30. (Original) The system of claim 27, wherein the photodiode comprises a CMOS-based sensor.

31. (Original) The flat panel imager of claim 27, further comprising a casing that holds the flat panel imager together, wherein the casing forms an aperture window to receive x-rays.

32. (Canceled)

33. (Currently Amended) The system of claim 36, wherein electric charges drawn across the semiconductor layer is greater near the first surface of the semiconductor layer adjacent to the charge-collection layer relative to the second surface of the charge-collection layer.

34. (Previously Presented) The digital radiography system of claim 36, wherein the flat panel imager is a TFT-based imager.

35. (Previously Presented) The digital radiography system of claim 36, wherein the flat panel imager is a CCD-based imager.

36. (Currently Amended) A digital radiography system, comprising:
an x-ray source to transmit x-rays;
a flat panel imager to receive the x-rays and to produce a digitized image,
comprising:
a semiconductor layer disposed above a charge-collection layer;
~~and~~
a bias electrode layer disposed above the semiconductor layer, the bias electrode to generate an electric field within the semiconductor layer;
and
a casing that holds the flat panel imager together, wherein the casing forms an aperture window to receive the x-rays; and
a display system connected to the flat panel imager, the display system to display the digitized image, wherein the semiconductor layer has a first surface adjacent to the charge-collection layer and a second surface adjacent to the bias electrode, and wherein the flat panel imager is configured such that x-rays traverse the charge-collection layer before propagating through the semiconductor layer.

37. (Previously Presented) An imaging method, comprising:
transmitting x-rays through a single photosensitive device layer; and
receiving the x-rays incident on a scintillator layer after the transmission
through the single photosensitive device layer.
38. (Previously Presented) The method of claim 37, wherein the scintillator
layer is disposed above the single photosensitive layer, the scintillator layer
having a first surface adjacent to the single photosensitive device layer and a
second surface farther away from the single photosensitive device layer relative to
the first surface, and wherein receiving further comprises receiving the x-rays at
the first surface of the scintillator layer before the x-rays propagate through the
scintillator layer.
39. (Previously Presented) The method of claim 38, wherein receiving further
comprises generating a greater light intensity near the first surface of the
scintillator layer adjacent to the single photosensitive device layer relative to the
second surface of the scintillator layer.
40. (Previously Presented) The method of claim 39, further comprising
detecting by the single photosensitive device layer visible light generated from the
scintillator layer.
41. (Original) The method of claim 40, wherein a mirror layer is disposed
adjacent to the second surface of the scintillator layer.
42. (Original) The method of claim 41, wherein a substrate layer is disposed
below the photosensitive layer.
43. (Original) The method of claim 42, wherein a protective layer is disposed
below the substrate layer.

44. (Previously Presented) An imaging method, comprising:
transmitting x-rays through a single charge collection-layer; and
receiving the x-rays incident on a semiconductor layer after the
transmission through the single charge-collection layer.
45. (Previously Presented) The method of claim 44, wherein the
semiconductor layer is disposed above the single charge-collection layer, the
semiconductor layer having a first surface adjacent to the single charge-collection
layer and a second surface farther away from the single charge-collection layer
relative to the first surface, and wherein receiving further comprises receiving the
x-rays at the first surface of the semiconductor layer before the x-rays propagate
through the semiconductor layer.
46. (Previously Presented) The method of claim 45, further comprising
generating an electrical field within the semiconductor layer.
47. (Previously Presented) The method of claim 46, wherein receiving further
comprises generating a greater electrical charge near the first surface of the
semiconductor layer adjacent to the single charge-collection layer relative to the
second surface of the semiconductor layer.
48. (Previously Presented) The method of claim 47, further comprising
detecting by the single charge-collection layer electrical charges drawn across the
semiconductor layer.
49. (Original) The method of claim 48, wherein a mirror layer is disposed
above the semiconductor layer.
50. (Previously Presented) The method of claim 49, wherein a protective layer
is disposed below the single charge-collection layer.

51. (Currently Amended) A digital radiography imager, comprising:
an energy detection layer;
an x-ray converting layer coupled to the energy detection layer; and
a single energy detection/x-ray converting interface in the imager, wherein
the x-ray converting layer has a first surface adjacent to the energy detection layer
and a second surface on an opposite side to that of the first surface ~~the energy
detection layer~~ and wherein the digital radiography imager is configured such that
x-rays traverse the energy detection layer and the single energy detection/x-ray
converting interface before propagating through the x-ray converting layer.

52. (Currently Amended) A method, comprising:
receiving x-rays in a scintillator layer; and
transmitting the x-rays through a photosensitive device before the x-rays
are received in any scintillator layer.

53. (New) A digital radiography imager, comprising:
an energy detection layer; and
a substrate comprising an x-ray converting layer, the substrate coupled to
the energy detection layer, wherein the energy detection layer is coupled to receive
light from the x-ray converting layer, wherein the digital radiography imager is
configured such that x-rays traverse the energy detection layer before propagating
through the substrate comprising the x-ray converting layer.

54. (New) The digital radiography imager of claim 53, wherein the x-ray
converting layer comprises a scintillating material to produce visible light from x-
rays.

55. (New) The digital radiography imager of claim 53, wherein the energy detection layer comprises photodiodes to detect the visible light.

56. (New) The digital radiography imager of claim 53, wherein the x-ray converting layer comprises a semiconductor material to draw electrical charges across the semiconductor material.

57. (New) The digital radiography imager of claim 53, wherein the x-ray converting layer comprises a photoconductor material to produce electrical charges across the semiconductor material.

58. (New) The digital radiography imager of claim 53, wherein the energy detection layer comprises a plurality of charge-collection electrodes to collect the electrical charges.

59. (New) A method, comprising:
providing a substrate;
receiving x-rays in an x-ray converting layer; and
transmitting the x-rays through an energy detection layer before the x-rays are received in the x-ray converting layer and before the x-rays are received in the substrate.

60. (New) The method of claim 59, wherein the x-ray converting layer comprises the substrate.

61. (New) The method of claim 60, wherein the x-ray converting layer further comprises a scintillating material to produce visible light from x-rays.

62. (New) The method of claim 60, wherein the energy detection layer further comprises photodiodes to detect the visible light.

63. (New) The method of claim 60, wherein the x-ray converting layer further comprises a semiconductor material to draw electrical charges across the semiconductor material.

64. (New) The method of claim 60, wherein the x-ray converting layer further comprises a photoconductor material to produce electrical charges across the semiconductor material.

65. (New) The method of claim 60, wherein the energy detection layer further comprises a plurality of charge-collection electrodes to collect the electrical charges.